



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,583	09/09/2003	James Robert Champion	FOM-139.02	3393

25181 7590 01/11/2005

FOLEY HOAG, LLP  
PATENT GROUP, WORLD TRADE CENTER WEST  
155 SEAPORT BLVD  
BOSTON, MA 02110

EXAMINER
----------

NATALINI, JEFF WILLIAM

ART UNIT	PAPER NUMBER
----------	--------------

2858

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

**Office Action Summary**

Application No.

10/658,583

Applicant(s)

CHAMPION ET AL.

Examiner

Jeff Natalini

Art Unit

2858

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-24 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/20/04</u> .  | 6) <input type="checkbox"/> Other: ____.                                    |

### ***Information Disclosure Statement***

The information disclosure statement filed 9/9/03, with respect to FR2763682, fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Drawings***

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because some parts are hand drawn and hand written. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informalities:

- In paragraph 2, pg 1, please update the application numbers of the copending patent applications.
- In paragraph 23, pg 13, line 1, data communications network is designated as 230; though in figure 2 the network is labeled 232.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 6-9, 11-13, 20, 22 and 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Macke, Sr. et al. (6137282, herein to be referred to as Macke).

In regard to claims 1 and 20, Macke discloses a system/method for determining a level of a substance (abstract), the system/method comprising:

a first conductive element (fig 4 (306)) conveying a first electromagnetic signal in proximity to a substance ("index marker or other highly conductive material", col 5 line 1-6);

a coupler (fig 4 310a-f) positioned at a dielectric mismatch boundary between the substances (each key is located between the substances as seen in fig 2), the coupler causing a change in the first conductive element upon the first electromagnetic signal traversing a part of the first conductive element substantially adjacent to the coupler (col 4 line 66 – col 5 line 10);

a second conductive element (fig 4 (304)) conveying a second electromagnetic signal based on the first electromagnetic signal and being coupled thereto by the change of the first conductive element caused by the coupler (col 5 line 4-8);

and a processor executing instructions to determine a level of at least one of the substances based at least in part on a time delay between the first and second electromagnetic signals (fig 1 (TDR sensor and processing unit); col 3 line 45-49 explains that the components of "prior art" figure 1 are in 102, 202, 302, and 402).

Macke lacks specifically stating that the change in the first conductive element is a change in capacitance and that there are a plurality of substances. However Macke does teach altering the characteristic impedance (col 5 line 4-8) and it is known to one skilled in the art that characteristic impedance is a function of the capacitance. Therefore it would be obvious to one skilled in the art that altering the capacitance would perform the same level measurement. MPEP 2144.04 VI B states that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). It would have been obvious to one with ordinary skill in the art at the time the invention was made for Macke to incorporate a plurality of substances ("index markers") in order to determine the distance to multiple markers.

In regard to claims 2 and 22, Macke discloses wherein the first and second conductive elements (fig 4 (306, 304)) are positioned substantially parallel to each other and substantially perpendicular to the dielectric mismatch boundary (space between keys, best illustrated in fig 2 and also seen in fig 4).

In regard to claim 3, Macke discloses an electromagnetic signal with ultra-wideband frequency (col 3 line 7-17, the pulse has a wide range).

In regard to claim 6, Macke discloses a transmitter for forming the first electromagnetic signal (fig 1 (12) generates the signal which is transmitted through fig 1 col 3 line 5-42).

In regard to claim 7, Macke discloses a receiver for detecting the time delay between the first and second electromagnetic signals (fig 1 (20, 22); col 3 line 27-30).

In regard to claim 8, Macke discloses wherein the receiver includes a time equivalent circuit (fig 1 (20, 22, 24); col 3 line 27-30).

In regard to claim 9, Macke discloses wherein the first and second conductive elements form a parallel conductor transmission line structure (fig 4 (306,304) with TDR practiced within the structure; col 1 line 36-37).

In regard to claims 11 and 12, Macke discloses wherein the first and second conductive elements exhibit quadrilateral cross-sections (fig 4 (306,304) the cross section will contain four sides) and substantially identical cross sections (fig 4, 306 and 304 are the same).

In regard to claims 13 and 23, Macke discloses wherein the amplitude of the second electromagnetic signal is substantially independent of dielectric properties associated with the substances forming the dielectric mismatch boundary (col 3 line 23-26).

Claims 4, 5, 15-18, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macke, as applied to claim 1 and 20, in view of Lutke et al. (6229476).

Macke lacks specifically a system/method comprising: wherein the dielectric mismatch boundary corresponds to a transitional region between a gaseous substance and a liquid substance; wherein the dielectric mismatch boundary corresponds to a transitional region between at least two of a vacuum, a gaseous substance, a liquid substance, a semi-solid substance, and a solid substance; a float for positioning the coupler at the dielectric mismatch boundary, the float includes a buoyant component and a weighted component; and wherein the tank is above or below ground.

Lutke et al. discloses a system for measuring the level of a liquid

- wherein dielectric mismatch boundary corresponds to a transitional region between a gaseous substance and a liquid substance (fig 1 shows a container (3) and liquid level (1), air/gas is located in the empty part of the container); [claims 4 and 5]

- the container could be positioned either above or below ground (fig 2), as some tanks or water supply containers are known to supply water from an underground source in many industries (col 1 line 15-18).

- a float for positioning the coupler at the dielectric mismatch boundary (col 4 line 16-26) in order to determine the level of liquid, the float includes a buoyant component and a weighted component (col 5 line 7-15) in order for it to stay at the level of the liquid.

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Macke to incorporate a gas/liquid dielectric boundary, and a float with a buoyant and weighted component as taught by Lutke et al. in order to accurately measure the level of a liquid while being cost effective with low maintenance (abstract).

Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macke, as applied to claim 1 and 20, in view of Resnick (5910188).

Macke lacks specifically stating the first and second conductive elements are flexible.

Resnick teaches a first and second conductive material in a liquid level meter being made with flexible materials (col 6 line 5-7).

It would have been obvious to one with ordinary skill in the art at the time the invention was for Macke to use flexible material for the first and second conductive elements as taught by Resnick in order to allow bending to enable the conductors to conform to the tank (col 6 line 6-7).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Macke, as applied to claim 1 and 20, in view of Kielb et al. (6373261).

Macke lacks wherein the processor communicates the substance level to a digital data processing device during a communication session.



Kielb et al. teaches a device to measure characteristics of a material by measuring reflected pulses, which contains output circuitry to transmit information relating to the product height (abstract).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Macke to incorporate communicating the substance level to a digital data processing device as taught by Kielb et al. in order to be able to control the current in the container in response to the height of the liquid (col 2 line 34-36).

#### ***Allowable Subject Matter***

Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. A system wherein the coupler exhibits a length corresponding to at least one-quarter of a propagation velocity pulse length of the first electromagnetic signal with the combination as claimed is not disclosed in the prior art.

#### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Morimoto (6237412) teaches a level detector wherein the capacitance varies in a known way with the level of a liquid. Roberge (3277711) teaches that a change in liquid level causes a change in capacitance between the probe and the tank.

Art Unit: 2858

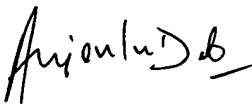
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Natalini whose telephone number is 571-272-2266. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 571-272-2233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeff Natalini



  
**ANJAN DEB**  
**PRIMARY EXAMINER**